GARDEN AND FOREST.

PUBLISHED WEEKLY BY

THE GARDEN AND FOREST PUBLISHING CO.

Office: Tribune Building, New York.

Conducted by . . . . . Professor C. S. Sargent.

ENTERED AS SECOND-CLASS MATTER AT THE POST OFFICE AT NEW YORK, N. Y.

NEW YORK, WEDNESDAY, APRIL 4, 1894.

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The Yellowstone National Park.

MUCH indignation has naturally been kindled by the stories recently published of the slaughter of the few buffalo which were nominally under Government protection in the Yellowstone Park. A late number of *Forest and Stream* contained a circumstantial account of the capture of one miscreant in the very act of skinning one of the five buffaloes which lay dead about him, and there were evidences that he had been quite as successful in his murderous work on former days. The situation is made more depressing by the knowledge that this is probably a representative case, and that other poachers are engaged in the work of exterminating the few surviving individuals of the countless herds which once ranged over the plains. More aggravating still is the reflection that no law exists for the punishment of such crimes. The fact that Yellowstone Park and the adjacent reservation have been set apart for the use and enjoyment of the people forever is really no protection to its forests or its game, but rather an advertisement to every outlaw that he can steal the timber, or set the woods on fire, or slaughter the big game, without fear of punishment. Obviously the first duty of Congress in this matter is to pass laws for the government of all our parks and reservations and then administer them in such a way that they will command respect. It is a national disgrace that property which belongs to all the people should be more unsafe than property that belongs to any one of the people.

But, while Congress seems slow to move where the case demands immediate action, there is a lobby which works without rest for measures relating to Yellowstone Park. The bills are nominally to "fix the boundaries of the park," but their real intention is to take away from it more than a million acres. The lands which they speak of adding to the park are really a part of it already—that is, they are part of the forest-reserve which properly belongs to the park and is under the same rules and government as the park itself. For years after the National Park was created thoughtful people had seen the necessity of its enlargement, better protection and maintenance, but such action was always blocked by this persistent lobby, which somehow had power to prevent the enactment of any park law which did not give the exclusive franchise for a railroad through its north-east corner. It was said in open debate in the Senate that this alleged railway company never had a meeting; that it never had books opened for subscriptions to its capital stock; that it had never made a report nor built a rod of railway, and that under the laws of the state of Montana all its supposed rights had been long forfeited. But, somehow, it was stronger in Congress than the friends of the park, and it was not until the President was authorized in an act, which escaped the attention of these adventurers, to set apart by public proclamation certain lands for the use and enjoyment of the people, that Yellowstone Park was practically enlarged to the dimensions and boundaries laid down in Senator Vest's bill. The same lobby which for years fought every measure to enlarge the park is now equally determined in the struggle to make it smaller.

At one time it was proposed, as a sort of a compromise, to cut off the corner of the park above the north fork of the Yellowstone, but the speculators objected to this because it would permit other railroads to pass through, and what they desired was a monopoly. They now, however, propose this river as the boundary, and with a stronger lobby than ever, they come armed with so-called expert opinion to the effect that the corner cut off contains valuable minerals, and is of no value to the park; that the portion of the forest-reserve to be rejected contains land valuable for agriculture and grazing, while it is of no value to the park, and that altogether the proposed change of boundaries will facilitate the administration of the park and afford better protection to its waters and forests and game. Now, the man who ought to know something about these matters is George S. Anderson, Captain of Cavalry, who is now acting as superintendent of the park. He asserts that, with the Yellowstone River for a boundary, all the antelope and mountain sheep in the park, and many of the elk, would be left at the mercy of poachers. He adds that this north-east corner is not only of peculiar value to the park, but is actually worthless for anything else; that the large deposits of coal and minerals exist only in the imagination of adventurers, and that the little there found is in a small placer belt, and can be secured without trouble. Captain Anderson denies, too, that there is any land which can be subdued to profitable agricultural use in the part of the reservation which it is proposed to restore to the public domain. Some of it does make good grazing-land, which is the best reason for retaining it, because it is one of the few good winter ranges—nearly the only good one—for the big game in the winter-time.

The fact seems to be that no one who has any real desire to preserve our forests or game would like to see a single rod taken off of the park or of the reserve. The men who have objected to the present boundary have done so from the outset from interested and personal motives. It is the selfish ends of a few speculators against the public good. Diminishing the park area might prove a temporary benefit to a few merchants in Montana, but it would in the end prove an injury to all the surrounding country. It would gratify some lawless skin-hunters and perhaps some timber-thieves, but no right, privilege or possession of any honest man in the country, so far as we can see, will be imperiled in the slightest degree by fixing the boundaries of the park forever as they are. Here is a place for Congress to make a determined stand. If a few speculators prove that they can get away from the people 1,861 square miles of land which have been formally dedicated to their use, and can set back park boundaries which have stood for twenty years, there is no security for the newer reservations, nor for those to be hereafter established. Any expert lobbyist can find equally valid reasons for dismembering every tract set apart for the protection of forests and game. Unless we are prepared to abandon the idea that it is possible to hold for public use any land devoted to such use by national authority, Congress must save Yellowstone Park from mutilation.

Apples at the Midwinter Fair.

WHEN I was a boy on an old farm four miles from the shore of San Francisco Bay the apples we grew seemed perfect. We had many varieties, because my father was always putting in grafts of new sorts. We soon discovered, however, that few of the old standard varieties did very well, and many of them very badly. The Rambo was dull in color, mealy and dry in flavor. Baldwins were often specked and full of dry rot. The sweet apples were less sweet, and the sour apples less sour, so the old folks said, than the same kinds as they remembered them in New England. The best market sorts we tried were Yellow Newtown Pippin, White Winter Pearmain and Smith's Cider. Valley Farms like this have for years produced nearly all the apples that reach the San Francisco market. These large, juicy, but second-rate apples have become known as "California apples." But the products of the real apple country of the state were hardly known, even in San Francisco, until recently, and apple-growing in these hill-districts is likely to be as important an industry as peach-growing at a lower altitude.

At the Midwinter Fair displays, in the various county exhibits, the apples have ranked next in number and attractiveness to the oranges. Horticulturists, noting these collections, are beginning to say that perhaps there is more money in the neglected apple than in any other fruit. "Perhaps," they are saying, "perhaps we can grow these great red mountain apples, fragrant, solid and perfect, and compete in eastern markets with anything from Vermont to the Ozarks." On March 15th I notice in perfect keeping condition apples of the following varieties: Fall Pippin, Rambo, Rome Beauty, Tulpehocken, Yellow Belleflower, Rhode Island Greening. These, and many others that are really but autumn apples on the lowlands, are February and March apples when grown at elevations of from 1,500 to 3,000 feet. Judge, then, what firm and perfect specimens of such apples as Lawver, Hoover, Ben Davis, Golden Russet, Wagener, Grindstone, Virginia Greening, Northern Spy, Esopus Spitzenberg and Yellow Newtowns are now in the displays of these new apple districts. The color is so much more brilliant in these mountain apples than in those from the valley that it is often difficult to determine a variety. In Ben Davis, for example, as grown at an elevation of 2,000 feet, the streaks are of purple, scarlet and gold. Newtown Pippin in such localities often acquires a red cheek on the sunny side of the tree. Baldwin is of a clear, waxen transparency. Winesap is twice as large as the Winesap of the valleys.

The first Apples brought to California were of the varieties most popular in the New England, middle and western states in the forties. These were first disseminated in the mountain towns; next in those valley towns that traded most with the mines; lastly throughout newly developed fruit-growing districts, chiefly in the lowlands. Shasta City and Placerville, for instance, had small, though very profitable, Apple-orchards, even earlier than Marysville or Sacramento. Then large orchards were planted along the river-bottoms early in the fifties, and one after another was abandoned, as the channels filled up and the water-table rose, or as floods tore the soil away. In those days people planted Roxbury Russet, Summer Pearmain, Early Harvest, Strawberry, Minister, Maiden Blush, Beefsteak, Jersey Black, Cayuga, Red Streak, Sweet Bough, Grindstone, Hubbardston Nonsuch, New York Vandevere and forty or fifty other sorts, all equally old-fashioned. Sometimes they planted seeds in distant mountain-camps, where grafted trees cost five and ten dollars apiece. Oregon, less of a mining country, early became famous for its apples, and for years supplied the bulk of the San Francisco demands. In 1858 the fruit-growers used to send apples to San Francisco in three grades, two sizes for picked apples, and "windfalls or culls" for cooking. These last sold for a dollar a box of forty pounds. Different varieties were seldom kept separate, or, if graded, other than by size, were divided into "red apples" and "yellow apples."

The display at the Midwinter Fair emphasizes in every particular the revolution that has taken place in Apple-culture. Nearly every one of the pioneer varieties has disappeared from the tables of the leading Apple-growing counties; the best of the new southern and western Apples have taken the place of the old favorites; the hardy Russians and "ironclads," so popular in Canada, Vermont and Minnesota, are not represented; there is no demand as yet for very hardy varieties of any fruit in Calfornia. There will not be any such demand until the settlers attack in earnest the great Pine-regions of the Sierras, where the winters are too severe for ordinary orchard fruits. The time is close at hand, however, when there will be a demand in portions of California for the hardiest varieties of not only the Apple, but also of the Apricot, Plum, Pear and Grape.

Apples are shown at the Fair from an old Mormon settlement in Carson County, Nevada, that are remarkable in their way. Here, on the east side of the Sierras, thirty miles from the California line, at an altitude of about 3,500 feet, in a dry, cold climate, are very famous orchards, and seedling Apples quite worthy of testing elsewhere. No larger, better-colored, more highly flavored apples have been on exhibition from any part of California or Oregon. This Sage-brush Apple district is very extensive; for two hundred miles north along the eastern slope of the Sierras—to Lassen, in fact—the pioneers often peddle bushels of apples around among the villages, for a cent a pound—apples of the highest quality and free from spot or blemish.

So varied and extensive have been the apple displays, that even old Californians note with surprise how important an industry was being neglected. The commercial development of apple-culture on the same scale as that of oranges and prunes, may be expected to date from the Midwinter Fair, and nurserymen are preparing to meet the demand.

The most interesting feature of the exhibits, however, is in the California seedling-apples, shown for the first time. There has been no organized effort to secure them, and yet about thirty new varieties have been sent in, all attractive, and some very promising, even when seen alongside such standard varieties as Yellow Newtown Pippin, Ben Davis and Hoover. The Experiment Station of the University of California is securing cions of these new sorts for its orchards. Indeed, it has been collecting Pacific coast seedling-fruits for years, and will soon publish a catalogue that will be of interest to fruit-growers everywhere. The University does not sell cions or trees, but exchanges with other experiment stations and with individuals in many parts of the world.

Niles, Calif. *Charles H. Shinn.*

Exotic Trees and Shrubs for Florida Gardens.—V.

VIBURNUM TINUS (Laurestinus) is a pretty evergreen shrub from southern Europe. It grows luxuriantly in a half-shady moist position. The ovate-oblong leaves are somewhat hairy and of a dark green color. The flowers appear in flat corymbs at the ends of the branches, and are delicately scented. To make dense specimens, pruning is necessary, and this should be done in early spring. The Laurestinus under good culture attains a height of from eight to twelve feet. In Florida it flowers from November to March. It needs fertilizing and a heavy mulching. V. odoratissimum, a native of China and the Khasia Mountains, excels V. Tinus in beauty. The leaves are large, elliptic, acute and glossy green. Its habit is dense and very ornamental, and it reaches a height of ten to fifteen feet. The flowers, which are white and sweet-scented, appear in dense corymbs in May. The lower branches rest on the ground if left to themselves. I have never seen this shrub in the gardens of Florida, although it is frequently seen in New Orleans and Mobile. Mr. J. P. Berckmans writes me that it grows well in all parts of Georgia and Florida. Under the name of V. Awafuki, I

received a very fine species with somewhat cordate leaves, which are glossy green, as if varnished. It comes from Japan. It is finer and more graceful in every respect than V. odoratissimum.

There are quite a number of other shrubs and trees that thrive admirably in the sandy soil of Florida. Malvaviscus arboreus grows luxuriantly in almost any position. Camellia Japonica is one of the most beautiful shrubs in the gardens of Tallahassee and Pensacola, but in south Florida it needs much attention and coaxing to make it grow and blossom. In Mrs. Herndon's garden, at Sanford, I saw, late in November, a shrub of the double white Camellia literally covered with exquisite waxy white flowers. The specimen grew in a half-shady place and was at all times carefully attended to. Doubtless the Camellia, as well as the Azalea (hybrid of Azalea Indica), will flourish luxuriantly in rich peaty soil in the gardens of south Florida and in the shady hummock-woods. The Tea-plant, Camellia Thea, should also be included among the ornamental shrubs. Its deep evergreen leaves, dense habit and fragrant white flowers entitle it to a place in every garden where choice evergreen shrubs are grown for their beauty and fragrance. It grows well in sandy soil.

Schinus molle, the well-known California Pepper-tree, does not thrive in the sandy soil, but likes a heavy loam. The Camphor and Cinnamon trees, Laurus Camphora and L. cinnamomea, make beautiful objects and grow well in the poorest sandy soil. Eriobotrya Japonica also makes a handsome ornamental tree and should be in every garden, however small.

Of deciduous trees and shrubs I shall only mention a few. Kœlreuteria paniculata grows well wherever it is planted. Paulownia imperialis makes a good growth if fertilized a little. Lagerstrœmia Indica and Melia Azederach, var. umbraculiformis, Grape Myrtle and China-tree are everywhere successfully grown.

We find, as a rule, that the trees and shrubs of China and Japan, as well as those from southern Europe and Chili, grow well in Florida, while those of Australia and Mexico are rather precarious. Most of the Australian shrubs do not find the soil congenial, while many from the sub-tropical regions of Mexico and the Himalayas find the summer too warm and the winter too cold. Judging from my experiments, the trees and shrubs of New Zealand do not grow at all in Florida, while a large number from southern Brazil and the Organ Mountains flourish admirably. There are quite a number of exceedingly beautiful California shrubs which should be tested in Florida. The Manzanita (Arctostaphylos glauca), the Madroña (Arbutus Menziesii) and the California Laurel (Oreodaphne Californica) are especially worthy of an effort to introduce them as ornamental shrubs into the gardens of the south Atlantic and Gulf states, and especially of Florida.

Milwaukee, Wis. *H. Nehrling.*

Foreign Correspondence.

London Letter.

An unusually large number of new and interesting plants were among the exhibits which crowded the exhibition hall at the last meeting of the Royal Horticultural Society. There were also many fine specimens of popular Orchids, including a grand example, beautifully flowered, of Dendrobium nobile-nobilius, and another of D. splendidissimum, var. grandiflorum. A single pseudo-bulb of D. Wardianum giganteum, about two feet long and carrying over fifty large richly tinted flowers, and a well-flowered specimen of the distinct and beautiful hybrid, D. Aspasia (Wardianum × aureum), first flowered in 1890 by its raisers, Messrs. J. Veitch & Sons, were among the most striking representatives of this genus, as exhibited by Mr. Statter, of Manchester. D. atroviolaceum was also shown in flower. A new hybrid, named D. Virginia, of Veitchian origin, which obtained a first-class certificate, is a cross between D. Bensoniæ and D. Japonicum. Although but a small plant with a single pseudo-bulb eight inches high, upon it there were ten flowers, each nearly two inches across, in form intermediate between the two parents, and in color milk-white, with a blotch of dull purple and a tinge of emerald-green on the lip. Phalænopsis Vesta, the hybrid raised by Messrs. Veitch from P. rosea, var., and P. Aphrodite, was shown and obtained an award of merit. It is better in color than P. rosea, the flowers over an inch across, pale rosy-mauve, the front lobe of the lip trowel-shaped, with a pair of short antennæ at the apex and colored dull purple, the side lobes paler, with numerous red dots. Cymbidium eberneo-Lowianum, bearing two flowers, also came from the Veitchian establishment.

An attraction of a special kind was a group of Dendrobium Phalænopsis shown by Messrs. F. Sander & Co. The exquisite beauty and variety of form and color revealed in this grand Orchid are such as to have won for it already a place among the very best of garden Orchids. Grown in a hot moist house, it has proved quite easy to manage. Several well-flowered plants of Cypripedium Rothschildianum, a beautiful variety of Lycaste Skinneri, named Mrs. H. Ballantine, which was awarded a certificate on account of its large size and pure white segments and rich rosy-purple of its labellum; Dendrobium Imperatrix, with stout tall pseudo-bulbs and erect spikes of white flowers, suggestive of D. undulatum or D. stratiotes, Spathoglottis aurea, which is grown exceptionally well at St. Albans, and a magnificent example of Odontoglossum Edwardii—these were conspicuous in the St. Albans exhibit; but the most remarkable of all was a new hybrid Phajus, called Marthæ, the result of crossing P. Blumei and P. tuberculosus, and which may be described as a P. Cooksoni, with sepals and petals colored pale buff-yellow. It is a decided acquisition. Baron Shrœder sent a spike of his Odontoglossum crispum apiatum, which is, perhaps, the most strikingly beautiful of all the many forms of this grand Orchid. The spike measured two feet in length, and it bore thirteen flowers, each of which was fully four inches across, the sepals and petals an inch wide, very crisp and wavy all round the edges, while the colors, white, with large blotches of rich chocolate-brown, and a tinge of yellow about the crest of the lip, were perfection. It is such flowers as this that justify the use of such terms as "queenly" for Orchids. The Society awarded it a gold medal. Vanda Cathcartii was represented by four spikes of its large, fleshy chocolate-brown zebra-marked flowers, all from the garden of the Earl of Cork, at Frome, where this rarely flowered Vanda is exceptionally well grown. Trichopilia sauvis, in a nine-inch basket, bore no less than thirty-seven of its large fragrant white and rosy-mauve flowers.

Cœlogyne Mossiæ, said to be a new introduction from Ceylon, was awarded a first-class certificate, and was accepted as a new species. It is in the way of C. ochracea, having short ovate pseudo-bulbs, lanceolate leaves six inches long, and a short curved raceme of six flowers each, nearly two inches across, well formed and pure white, with a blotch of yellow on the lip. It is a distinct and pretty little plant.

Masdevallia Gargantua, a rare species, with the foliage of M. elephanticeps, and a large fleshy flower of unattractive form and color, was shown in bloom, and while its maw-like yellow and crimson-purple flowers arrested attention, they were generally called ugly. In addition to its unpleasing appearance, it has also a strong repellant odor. Still, for a Masdevallia, it is a most remarkable plant, deserving to rank with Stapelias. Next to it stood a fine example of the elegant Cirrhopetalum picturatum, carrying four scapes, each supporting a whorl of about ten flowers. Both of these were exhibited by Sir Trevor Lawrence, who also sent a plant of Bulbophyllum Sillenianum, which was described by Reichenbach in 1884 from a plant introduced from Burma, but is still very rare. It has roundish pseudo-bulbs an inch long, leaves five inches long by half an inch in width, and slender one-flowered scapes as long as the leaves, the flower being over an inch

across and remarkable in having the three dorsal segments erect and the two lower ones horizontal, their color being bright yellow, with lines of green. The lip is small, delicately hinged and purplish in color. Odontoglossum excellens chrysomelanum, also from Sir Trevor Lawrence, was awarded a first-class certificate. It is remarkable for the clear yellow and the almost crimson color of the blotches of its segments. Dendrobium Sybil, a hybrid between D. Linawianum and D. bigibbum, raised by Mr. Cookson, was deservedly awarded a first-class certificate, its purplish-yellow-throated large flowers being both distinct and attractive.

The following plants were among the miscellaneous exhibits: Andromeda Japonica, a group of bushes six inches high, clothed from top to bottom with large panicles of Lily-of-the-valley-like flowers—perfect cascades of white bells. Bignonia venusta, shown from Lyon House, where this grand greenhouse climber has been a feature for many years. Its long string-like shoots are clothed to a length of several yards with bunches of large tubular orange-yellow flowers. It is one of the finest of the genus. Rhododendron albicans, a hybrid between R. mollis and R. occidentalis, raised about ten years ago by Mr. A. Waterer, was shown in flower, and obtained an award of merit. It is exactly like R. mollis in foliage and size of flowers, which are pure white, with a blotch of lemon on the upper segments, and are produced in large full trusses.

Ferraria antherosa is a singular-looking Irid from the Cape, with stems two feet high, clothed with fleshy amplexicaule leaves and greenish purple, Iris-like flowers. It is grown at Kew, and is interesting to those who are botanically inclined.

Rhododendron racemosum, from Messrs. J. Veitch & Sons, is a delightful little pot-shrub, which is said to be hardy at Coombe. It is less than a foot in height, and has Box-like foliage and numerous compact little trusses, two inches in diameter, of white flowers with pink tips. It is a distinct and promising little plant, for the introduction of which we are indebted to the French horticulturists, who obtained it from Yun-nan.

Loropetalum Sinense is a rare little shrub, related to Hamamelis, with alternate ovate leaves an inch long and clusters of flowers with long, narrow, whitish petals. It might be made a useful plant for the cold greenhouse. It is a native of China, and is not hardy here. Messrs. Veitch showed a basket of nice little specimens of it covered with flowers.

Shortia galacifolia was shown in finer condition than I had ever before seen it, plants in small three-inch pots, and no larger than a man's fist, carrying about twenty pure white, nodding, fringed bells. It is a charming little alpine, hardy with us, and I learn it is likely soon to be abundantly represented here, one garden alone possessing a large frameful of healthy, newly imported plants.

Streptocarpus Wendlandii.—A group of this distinct new species was shown by Messrs. Sutton & Sons. It is remarkable for the size of its single leaf, which rivals that of S. Dunnii in size, but differs in being less wrinkled and in being purple beneath. The flowers are borne on erect stout scapes two feet high, freely branched and clothed with a perfect sheaf of violet-purple white-eyed flowers one and a half inches across. The introduction of this plant is mysterious. About eight years ago a chance seedling came up in the fernery at Kew. It was soon seen to be distinct, and in two years its single leaf was three feet long by two feet in width. When it flowered it was thought to be a variety of S. Saundersii, of which there is a figure in the *Botanical Magazine*, t. 5251. About three years ago it was offered by a Continental nurseryman under its present name. There are some fine plants now in flower at Kew which are hybrids between it and S. Dunnii. The flowers are large, not unlike those of S. Wendlandii in shape, but colored deep magenta.

Vriesia Rex, a hybrid or seedling shown by Monsieur Duval, of Versailles, received an award of merit on account of the deep, uniform crimson color of its large imbricating bracts, which contrast prettily with the yellow flowers. It belongs to the same set as V. psittacina and V. Morrineana.

Blue Primroses were shown by Mr. G. F. Wilson, a collection of some three dozen flowers of various shades of blue, plum-blue, lavender, etc. There are true blues among them.

London. *W. Watson.*

New or Little-known Plants.

Prunus Watsoni.

FOR a shrubby Plum which has been growing in the Arnold Arboretum since 1880, when it was raised from seed sent from Ellis, Kansas, I propose the name of Prunus Watsoni * (see page 135), in honor of Dr. Louis Watson, of Ellis, a brother of the late Sereno Watson, through whom I first became acquainted with this plant.

As it grows in the Arboretum, Prunus Watsoni is a twiggy shrub three or four feet high, with slender, rigid, zigzag branches which are bright red and lustrous during their first year, and later growing darker, are marked with pale lenticels, and develop spur-like lateral branchlets. The winter buds are acute, an eighth of an inch long, and are covered with many closely imbricated, light chestnut-brown scales; those of the inner ranks are accrescent, and at maturity are half an inch long, three-lobed, with small acute lateral lobes, and a larger terminal lobe, rounded at the apex, and remotely crenulate-serrate. The leaves are an inch to an inch and a half long, half an inch to two-thirds of an inch wide, thick and firm, lustrous on the upper and pale on the lower surface, with slender midribs, obscure veins, and bright red petioles half an inch in length. The flowers, which appear about the middle of May, are very fragrant, and are produced in the greatest profusion, quite covering the branches; they are borne on slender glabrous pedicels a quarter of an inch long, in crowded three to four flowered fascicles, and when expanded are half an inch in diameter. The fruit, which ripens in great quantities, and sometimes hangs on the branches late into the winter, is two-thirds of an inch in diameter, with a thick bright orange-red skin without bloom, and bright yellow juicy flesh, which, although slightly austere, is edible, and sometimes of good quality.

It is this plant which is the Sand Plum of southern and south-eastern Nebraska and central Kansas, where it forms thickets in low sandy soil near streams. On the banks of the Saline River, where, ten or twelve miles from Ellis, it is very abundant, the plants vary from three to ten or twelve feet in height; on some individuals the fruit ripens early in August, and on others as late as the 1st of October. The Sand Plum is occasionally planted in the gardens of central Kansas, and the wild fruit is gathered in large quantities and sold in the towns.

Prunus Watsoni has been mistaken by travelers in the trans-Missouri region for Prunus angustifolia, the Cherokee Plum, from which it differs in habit, in its thicker leaves, thicker-skinned fruit and smaller stone, the stone of Prunus angustifolia being less deeply pitted, thick-margined on the ventral suture, conspicuously grooved on the dorsal suture, and less abruptly flattened at the apex.

The hardiness of Prunus Watsoni in regions of extreme cold, its compact dwarf habit, abundant flowers and handsome fruit make it an ornamental plant of first-rate value, and as selection and good cultivation will doubtless improve the size and quality of the fruit, it will, perhaps, become a valuable inmate of small fruit-gardens. *C. S. S.*

* Prunus Watsoni, n. sp.—A shrub six to ten feet high. Leaves, ovate, acute, rounded or wedge-shaped at the base, finely crenulate-serrate, lustrous on the upper, pale on the lower surface; petioles slender, grooved, bi-glandular at the apex. Flowers in crowded few-flowered fascicles; calyx cup-shaped, the lobes acute, rounded at the apex, eglandular, ciliate on the margins, pubescent on the inner face; petals inserted remotely on the glandular disk, narrowly obovate, rounded and more or less erose above, contracted below into short claws, pure white; filaments glabrous; anthers minute, obtuse, yellow or bright red; style slender, exserted. Fruit globose, or rarely oblong, orange-red; putamen turbid, rounded on the ventral suture and rounded and sometimes obscurely grooved on the dorsal suture, abruptly compressed at the narrowed apex, thick-walled, conspicuously porulose.

Cultural Department.

Patience with Germinating Seeds.

EVERY seedsman is familiar with the complaint of "bad seeds" which comes from customers every season, and almost every seed-sower at some time has annoyance with seeds which refuse, or seem to refuse, to grow. The fault does not always lie with either one party or the other. It is true that seedsmen are not always as careful about the vitality of their seeds as they should be, but, on the whole, first-class firms are to be trusted. The temptation to keep unsold seeds for sale year after year is great, and these are too often mixed with the fresher seed. Country general stores are especially likely to keep their seeds over, just as nails or thread would be kept, and many seeds lose their vitality by long keeping. But the fault is not always with the seller, for the fact that the seeds are a little old and dry in some cases means that they will simply take a little longer to germinate than they would if sown while fresh. Then there are some kinds of seeds, notably those of certain kinds of trees and shrubs, which naturally remain dormant for a season before they germinate, and then the seedlings may continue to appear during several months. It is this tardy germination which has often caused planters to destroy valuable sowings with the idea that the seeds were worthless.

A valued correspondent in Germany, who shows great enthusiasm in the cultivation of hardy plants, has written that he has made many attempts to raise the Symplocos cratægoides from seed received both from Japan and from the Arnold Arboretum, and always failed to get any seedlings. Finally he gave the seeds a longer chance, and at last is rewarded, and writes, "Seed planted in a box December 5th, 1891, first began to send up little seedlings in October, 1893. Both winters the box has been outside covered with snow, and now I have placed the box in warm quarters, where young plants spring up every now and then."

Many seeds require proper cleaning from fruity coverings before they will germinate well and give satisfaction, and, as is well known, exposure to the action of frost and moisture or soaking in warm water will often hasten seeds in starting into growth. With regard to the Symplocos, it may be assumed that not one per cent. of the large quantities of seeds sent from the Arboretum during a number of years, have been known to germinate, and in most cases they have been discarded as worthless after the first season's trial.

Certain kinds of Maple-seeds will grow the following spring if planted soon after they are ripe, but if allowed to dry, which is generally found expedient when they are to be shipped long distances, they are not likely to germinate until the second year. As our Red and White Maples ripen their fruits in May or June these seeds will produce nice little plants before autumn, if sown in moist soil as soon as mature. This is also true of the Elms and of the Red Birch (Betula nigra), which ripens its fruit in June. The seeds of most Ashes (Fraxinus) will take a good while to germinate if allowed to become unnecessarily dry. It is usually the second year before the little seedling plants of the Tulip-tree appear from the artificially sown seeds, or, technically, fruits; but, as usually about nine-tenths of these latter contain no true or fully developed seeds, only a small proportion of the sowing can be expected to result in plants.

Very often the same lot of seeds will be found to germinate unevenly, new plants appearing during a period of many months and with an interval of a winter between. This peculiarity is often seen in sowings of Apple-seed which had been allowed to dry a good deal before planting. Hard-shelled seeds of Leguminous trees, like Kentucky Coffee-tree and Honey Locust, may be expected to rest a good while in the soil before they start into growth, unless they have previously received special treatment. Those seeds which are surrounded by a hard bony covering may commonly be expected to grow in the second rather than in the first year, especially if the seed is not planted until spring. Among these are Haw-

Fig. 25.—Prunus Watsoni.—See page 134.

thorns, some Roses, Dogwoods or Cornels, Tupelos, Viburnums, Styrax, Halesia or Silver-bell, Hornbeam, Hop-hornbeam and the Winterberries (species of Ilex) and Hollies. Some of the Holly-seed may not germinate until even the third year after it has been in the ground, so that the seed-bed should not be too hastily destroyed.

In planting any seed it is generally safer to commit the error of covering with too little soil than with too much. Light seeds are often covered so deeply that the little plantlet cannot reach the surface, and it would have been even better to have sown the seed on top of the ground. In most cases the chief advantage of deep covering lies in the fact that the seeds are likely to obtain more equable moisture, but the surface of no seed-bed should be allowed to become really dry, because if the seeds have started into growth and dryness overtakes the young plantlet before it has formed and sent down good rootlets, it is only too likely to dry and shrivel beyond recovery.

Arnold Arboretum. *J. G. Jack.*

Work in the Flower-garden.

PROTECTIVE coverings for flower-beds have not been of so much value during the past winter as in some seasons, owing to the heavy coat of snow that has remained on the ground all winter. The ground did not freeze at all in many places, and the growth of all bulbous plants will consequently be well advanced. To-day I examined some Lilies in the Rhododendron bed, upon which a mass of leaves had been placed, and growth above ground had already begun, so that great care was necessary in removing the litter. The same is also true of the Narcissus bed; formerly a covering for these plants was not thought needful, but some of the Spanish Daffodils do not come up strong after a hard winter, and we now cover the whole bed in the fall after the ground has frozen a little.

In this section but few plants have yet begun to move in the borders, but as soon as they do, any transplanting that needs attention should be done without delay. It is best to wait until plants start to grow before disturbing them, as they then start off more freely after the shift. Herbaceous plants raised under glass must be carefully hardened off before setting them out, for indoor treatment makes them tender.

In the cultivation of Hollyhocks, we find it best to raise a new lot each year and to set them out in their permanent places in spring in well-prepared soil. There is thus a chance to protect them in the fall; no loss is sustained from winter-killing, and there is little check from spring transplanting. After Hollyhocks flower once, they are easy victims to severe cold alternated with thaws, and they are not to be relied upon the second year. The sowing for the following year's display should be made in the latter part of July. The same treatment applies to Canterbury-bells and Pansies; these are now being transplanted to the open borders where they are to flower, and between each, later on, will be planted annuals, such as Zinnias, Asters, or Stocks.

The larger portion of our Japan Anemones are grown in pots for the greater security of the bloom in fall. These are stored away in a cool cellar, and they often freeze during the winter; this does them no harm, but checks very early growth in spring. They are all starting now, and will soon be taken outdoors where a little protection can be given them on cold nights. Tritomas (Kniphofias) are treated in the same way; this early start assures an early blooming season and escape from premature fall frosts.

Sweet Peas can never be sown too early, though the mistake is often made of sowing them too late. They should be put into the ground at once. It is often difficult to carry Sweet Peas through the hot season, as they are very susceptible to drought. This was our trouble last year, and in trying to avoid a repetition we have dug a deep trench, and after taking out the sandy subsoil, replaced it with clay and filled in with good manure mixed through the better top soil. With occasional watering, we hope in this way to overcome the effect of the hot weather. Great advances have been made of late years in the quality of Sweet Peas; the difficulty now is to know which kinds to choose out of so many. We never depend on novelties, but always take well-known kinds of desired colors, when results may be counted upon.

An old but fine bedding-plant, too seldom seen, is Perilla Nankinensis. The rich dark foliage makes a fine background for a wide border, and the color keeps good throughout the season. A packet of seed will provide a large number of plants, and it is as easy to raise as most annuals. The foliage is a rich dark purple, and it is beautifully laciniated.

Roses have wintered better this year than I have ever known them to do; few gaps need filling, and even such kinds as La France and Duchess of Albany are in good vigor without any protection whatever, though their lack of protection was an oversight last fall. Spring is the best time for making new Rose-beds. Experiences in fall planting, even of American-grown Roses, have only served to emphasize this fact. Where large beds of hardy Roses are grown in the flower-garden it is always best to keep a few in the reserve border to supply any losses; these should all be lifted and replanted every spring, so as to keep their roots from spreading too much. Frequent transplanting will keep a Rose in fit condition to move for years, and this is especially true where they are wanted in fall for winter forcing in pots or boxes. Outdoor Rose-culture is rather discouraging at times; rose-bugs seem to get the upper hand each year, no mater what is tried by way of prevention, and I am satisfied there is no cure; nothing seems to avail except hand-picking.

Cannas take a prominent part in all outdoor flower-gardening, and their full value is only beginning to be recognized. The newer kinds that have appeared in the last year or two will give a great stimulus to their use; such sorts as Star of 1891, Madame Crozy, Alphonse Bouvier, Florence Vaughan, Captain Suzzoni, Charles Henderson, J. D. Cabos, Paul Bruant and others have rapidly made names for themselves, especially at the World's Fair last summer, where they made one of the principal horticultural features. Roots ought to be started now, ready for planting out in June; the best results are obtained when the roots are well established in six-inch pots before planting-time. There is then no delay after planting, and they quickly furnish the space they are to fill. Cannas also make ideal subjects for planting in tubs or boxes for summer use near the house. For this purpose only the dwarf large-flowered kinds should be used, taking care to have rich soil and to feed them liberally as the season advances, for they are strong feeders.

South Lancaster, Mass. *E. O. Orpet.*

Summer-flowering Carnations.

ALTHOUGH the border varieties of Carnations which do so well in Europe, prove disappointing here as a rule, there are a few American-grown kinds of the perpetual-flowering section which bloom successfully out-of-doors with us in the summer months. While the Marguerite, Grenadin and some other varieties bloom from seed sown in spring, and usually come double, they do not produce as large nor as fragrant flowers as may be obtained from a small assortment of early propagated greenhouse varieties.

To produce strong plants fit to set out early in May the proper time to put in cuttings is in December and January. When well rooted, pot off into small pots, and transfer from these again to three-inch pots about the end of March. The plants should be grown along in a cool house, and early in April may be placed in a cold frame. Here we plant outdoors about May 15th in rows one and a half feet apart, allowing the plants one foot in the rows. No topping should be done after the end of May if early flowers are desired. When the bloom-spikes are well advanced they must be staked, and it is well to look over the plants once a fortnight and tie up shoots requiring it. A mulching of fine well-rotted manure, and occasional waterings in dry weather, is beneficial. We generally have flowers early in July, and from then until the end of October, or until a sharp frost. Plants which had bloomed all summer were last fall lifted in full bloom and planted in the Carnation-house along with those specially grown for winter blooming, and these have flowered fully as well as any of the others.

Last season we tried Lizzie McGowan and Mrs. Fisher for white flowers; the latter proved to be the finest variety in the whole section. Lizzie McGowan bloomed a little, but not enough to warrant its use again. Among scarlets, Hector easily took the lead; Florence, a less brilliant-colored kind, flowered fairly well, but Portia was useless. Golden Triumph and Louise Porsch gave an occasional bloom, but did not pay for the ground occupied, and both rusted so badly that we have discarded them. Grace Wilder was the only pink variety giving any bloom, and as it also is affected by rust we will not give it a further trial. Last summer we noticed a very fine bed of Nobscot, a scarlet seedling of Mr. Nicholson's introduction, at Framingham. The plants were a mass of bloom all summer; the flowers are smaller than those of Hector, borne on stiff stems, and do not burst the calyx. This variety is a decided acquisition, and we purpose growing it next summer. Possibly the new pink Carnation, Ada Byron, may prove a good summer bloomer, as it possesses many of

the properties of Mrs. Fisher. This variety with Nicholson and William Scott we shall try this year, and hope one of the trio will prove a success. They seem to be rust-proof so far, which is more than can be said for some other novelties. Hector, Mrs. Fisher and Nobscot have shown no signs of disease. Ferdinand Mangold as a crimson was not a success, but we purpose giving it a further trial; it appears to be rust-proof.

A good pink variety for outdoor blooming is what we most desire to find at present, one that will bloom as freely as Mrs. Fisher, Hector and Nobscot. No doubt, a yellow and crimson will turn up in due course, and it will then be possible for any one to have fine Carnations grown in the open air for three months in the year.

Taunton, Mass. *W. N. Craig.*

Celery Culture.

At a meeting of the Michigan State Horticultural Society, Professor W. W. Tracy delivered an off-hand address on "Celery Culture," in which he stated, at the outset, that any farmer in Michigan who fully understood and carefully attended to the character and wants of the plants could raise in his home-garden better celery than can generally be bought in the market. This special knowledge is at the base of all successful garden practice, being generally a more important factor than any natural advantage, and Professor Tracy went on to say:

There is nothing in the soil and climate of Long Island which gives it any superiority for the cultivation of flowering bulbs, but the Long Island growers produce better and cheaper bulbs than others, because they understand their plants. The profits of Onion-growing about Painesville, Ohio, is due in the same way, not to the soil, but to a perfect knowledge of the character and wants of the plants. Certain grades of Celery can be produced more cheaply on the muck lands of Kalamazoo, but Celery of the finest quality can be grown on almost every farm in Michigan.

Yesterday we took out some celery on our trial-grounds. Many of the stalks were eighteen inches long, many an inch in diameter, and so brittle that I could and did take a stalk by each end, and by a quick move of the hands, in opposite directions, snap a piece out of the centre, whose ends were as square as if they had been cut by a knife. Those who used it say they don't care to eat any that they can buy, after having this. And yet, this was grown on a clay soil that, six years ago, would make brick; and if Celery can be grown on that, perhaps as poor a soil for its growth as can easily be found, every Michigan farmer ought to grow it. They certainly can, if they know how; and to know how they must study the plant.

Every flavor or scent, if intensified sufficiently, becomes disagreeable. Thus the intense flavor of the green portion of the celery is disagreeable, bitter, and in some degree poisonous. When any vegetable growth is made rapidly, and in the dark, it becomes white, and its natural flavor is lessened, made more mild; and in such cases as the leek, endive and celery, made much more agreeable.

Again, crispness, succulency and tenderness in vegetables are developed in proportion to the rapidity of growth. What we need, then, to produce well-flavored, crisp, succulent, tender celery is a rapid growth in the dark. How can we do this? Celery is a very peculiar plant in its habit of growth. If we plant an ounce of Celery seed under favorable conditions, it will be nicely up in thirty days, and if we wash the little plants clean of earth they altogether will weigh from five to twenty ounces, an increase of from five to twenty fold in the first thirty days.

Now, plant an ounce of any of the quick-growing Radishes, under equally favorable circumstances, and in thirty days they will be fit to market, and the 3,500 roots produced, if every seed makes a plant, will weigh from 2,000 to 4,000 ounces, an increase in the first thirty days of from 2,000 to 4,000 fold, against the Celery's increase of from five to twenty fold. This shows how slowly the Celery-plant grows at first. But, with every succeeding month, not only the actual growth, but the rate of growth, increases until, as it approaches maturity, it is, perhaps, the most rapidly growing plant in the garden. But you all know that growth necessitates food, and in this fact we find a reason for our plant's action; for, during the slower-growing, earlier periods, the plant was not only extending its root-surface and putting itself in position to collect enormous quantities of food from the soil, but was also storing in the roots and the thickened collar at the base of the leaves an extra supply of food to be used on demand. We see how the life-plan of the plant fits with our purpose of securing a rapid growth in the dark. We simply wait until it is prepared to grow most rapidly, and then gather and hold the leaves up so closely as to shut out the light and keep the growing leaves of the centre in the dark, and our object is accomplished. This we do by first drawing the leaves into an upright position and holding them there with earth. Then, drawing them still closer and banking them with more earth, until we have completely shut out the light from the now rapidly growing centre, we secure the white, crisp, tender central leaves which are so delicious.

It is a mistake to think that earthing-up turns the leaf-stems which we earth-up white, and makes them crisp. It does not. It only makes those that grow after we earth-up white and crisp, and you can thus see how useless it is to expect good celery from slow-growing plants.

But, to have quick growth, we must have abundant food in the soil, abundant water to dissolve this food, and abundant roots and vitality to convey it into the plant. The golden rules, then, for growing fine celery are:

1. Secure strong plants, by protecting the weak and slow-growing seedlings from injury from overcrowding or from more rapid-growing weeds.

2. Set the plants in soil which is as rich as it can possibly be made. The best rule for it is that for making the mince-pies we used to dream over at Thanksgiving-time—make them as rich as you can afford, and then shut your eyes and drop in two handfuls more.

3. Bank up and give plenty of water when the plants are in their greatest rapidity of growth.

Correspondence.

Earth-worms in Flower-pots.

To the Editor of Garden and Forest:

Sir,—I have a Fuchsia and a small Hydrangea in pots, which have looked fairly well during the winter, but they are now gradually losing their leaves. A friend suggested that earth-worms might be eating the roots, so I have transplanted them and find a dozen or fifteen worms in each pot. Is it true that these worms eat the roots or injure the plants in any way?

Boston, Mass. *K. L.*

[As a rule we should look upon earth-worms as useful creatures and their work as of real service to tillers of the soil. They are continually renewing the surface-soil with finely pulverized earth brought up from below, and their burrows allow freer access of moisture and air. They are, in fact, true subsoilers, and we may get a good idea of the important part they play on the earth's surface by reading Darwin's *Vegetable Mold and Earth-worms*.

The action of worms also tends to hasten the decay of vegetable and other remains in the soil, and so to prepare them for assimilation as plant-food. But when very numerous they are often troublesome, especially on small areas, as in flower-beds and in flower boxes and pots. Too numerous holes allow access of too much air to the roots; the tender roots themselves are disturbed and, perhaps, destroyed by the worms; and as it is known that the castings or excretions of worms are charged with certain acids, these may have an injurious effect when too abundant.

It is the habit of worms to come to the surface in the evening, and if the soil is well-watered and the previously darkened plants are quickly examined by light the worms may be found and caught on the surface. Watering the soil with strong lime-water is said to drive them out, and a weak solution of ammonia or of smelling-salts will bring them to the surface, when they may be easily caught. Strong tobacco-water would probably answer the same purpose.

If care was taken to subject potting-soil to strong heat before using, or to treat it with boiling water, all worms and other insects and their eggs would be destroyed and there would be no trouble from them. Where only a few plants in pots are affected it would be a simple matter to repot them with fresh soil which had been previously thoroughly heated in the oven, or scalded with water and allowed to drain.—Ed.]

Forest-growth.

To the Editor of GARDEN AND FOREST:

Sir,—In your correspondence columns of issue February 7th Dr. Hoskins gives some interesting experience of his plantings, and finishes up with some quotations from *The Vermont Farmer*, in which it is made to say that a Pine plantation of seventy-five years' growth produced from 40,000 to 50,000 feet of timber per acre. This does seem an enormous yield for so short a period, and quite beyond anything that can be grown on this side. In looking over a well-grown Scotch Fir wood of ninety years' growth a few days ago I was satisfied there was not more than 5,000 cubic feet to the acre. The situation was somewhat exposed, however. I see, also, on turning up a copy of the charts used in the Danish schools of forestry, that the average contents of an hectare of Fir at eighty years' growth is 660 cubic metres, which will be equivalent, speaking roughly, to something like 6,000 feet to the acre. We expect much better results, however, from the Douglas Fir, but it has not been sufficiently long planted yet, nor in such quantities as to state accurately for purposes of comparison its timber-producing capacity here; suffice it to say, however, it is one of the best American introductions, and grows about as fast again as the Scotch Fir on good soil.

My object in writing you, however, is to express my pleasure on reading an account in your paper a few weeks ago of some planting by Mr. Robert Douglas, I believe, in Kansas. It struck me at the time that if this methodical plan could be carried out on the American and Canadian prairie to some appreciable extent, it would very soon improve the aspect of the country immensely. If timber could be produced at one-quarter the rate before mentioned it would pay the farmer well; besides, the break afforded in these northern regions in checking blizzards and hot winds would also prove invaluable. Mixed farming must ultimately be the method which will give the safest return, and one succeeds much better with wood at hand for farm-buildings and for sheltering stock. The Douglas Fir might succeed well out there. The European Larch has been a great success in this country for fencing purposes and farm-buildings. The great north-west is the quarter to which thousands in the old country look for a home, and every facility should be afforded to make it, at least, more pleasant. And next to a plan of regenerating the fine natural forests on the American continent, would be some judicious prairie planting.

Blinkbonny, Earlston, Scotland. *W. W. Robertson.*

[In this country it is the practice to estimate timber by board measure, and not in cubic feet. In America 50,000 feet of timber means 50,000 square feet of boards one inch thick. So that the growth recorded by *The Vermont Farmer*, although heavy, is not so enormous as it seems to Mr. Robertson, and does not differ materially from the European instances cited in his letter.—ED.]

Russian Apples.

To the Editor of GARDEN AND FOREST:

Sir,—I observe that in your issue of March 7th Mr. Jack gives Charlottenthaler as a synonym of Yellow Transparent. This is hardly correct, and an error like this should be arrested before it leads to trouble. The facts are that Charlottenthaler, Grand Sultan and Yellow Transparent belong to one family, and their fruits resemble each other closely in appearance, though they differ in quality, and they do not ripen at exactly the same season. I have grown and tested them carefully together. Yellow Transparent is the poorest of the three in quality, but it is the only one of much commercial value because the other two are subject to a bark blight which destroys the trees almost before they come into bearing. Most of the prominent Russian Apples are grouped in families, and are more or less closely reproduced from seed.

Newport, Vt. *T. H. Hoskins.*

Dangers from the Pride of China Tree.

To the Editor of GARDEN AND FOREST:

Sir,—The article on page 92 brings to mind certain experiences of mine, when, as a young girl, I spent some time on a South Carolina plantation. The only trees nearer the house than the long avenue of approach were an immense Crape Myrtle, and a little farther away a fine Pride of China Tree. Under this tree the boys of the family, not too much my juniors to invite me to share in some of their escapades, found, when its berries were ripe, an occasional prize. They were quite in the habit of picking up birds which had eaten these berries to their destruction, as they were summarily served and eaten at certain irregular picnics. As I was told, the birds became intoxicated from feasting upon this too stimulating and delightful food, of which they were evidently inordinately fond. Having eaten heartily, they would fall to the ground, overcome; in this condition they were picked up, their necks wrung, and after being plucked and wrapped in a shaving of bacon were suspended from a bent stick and roasted before a surreptitious fire. After this process they were eaten with infinite zest. Occasionally, by great watchfulness on the part of a squad of small negroes, quite a string of birds would be collected before the "young masters" came out of the schoolroom.

The birds, if left to themselves, soon recovered, and took themselves off, with a headache, perhaps. At all events, that the inebriated birds could be eaten without any injurious effect, save a slight prick of conscience, I am abundantly able to testify.

Amherst, Mass. *D. H. R. G.*

Recent Publications.

The October and November issues of the *Bulletn of Miscellaneous Information* of the Royal Gardens at Kew, contain a most interesting paper on a botanical journey along the Sikkim-Thibet frontier, made by Mr. G. A. Gammie, an assistant in the Government Chinchona Plantations at Mungpoo. The article is made specially interesting by the publication in the same number of the bulletin of a letter written to the Director of the Royal Gardens, by Sir Joseph Hooker, who, more than fifty years ago, explored this very region and first made known the character of its vegetation.

In writing on Mr. Gammie's report, Sir Joseph says:

The perusal of it strengthens in me the opinion which I have long entertained, but which I have never formulated, that Sikkim, for its area, presents one of the richest, if not the richest botanical region on the globe. And further, that though no more than about forty miles from east to west, and one hundred from north to south, and situated beyond the northern tropic, I believe that when all that is known of its vegetation shall have been brought together, it will prove to be a better microcosm of the flora of the globe than any other area of equal or even of much larger dimensions. Thus, in its alpine region, the floras of the European, Siberian, Chinese and American mountains are all richly represented, and there also are found the principal types of the steppe and desert vegetations of Thibet and central Asia. In its temperate region European genera abound in species in greater numbers than they do furthest west in the Himalaya, or probably than they do further east in the same range, where different climatic features prevail; and in the same region types of Chinese, Japanese and North American genera appear in force, which rapidly disappear in advancing toward the western Himalaya. Lastly, in the tropical region the Malayan flora disputes precedence with those of the plains and lower hills of the Indian continent, Burma and Ceylon, as represented by genera and species, many of which are also characteristic of tropical Africa.

Some idea of the vegetation of this region will appear from the following extracts from Mr. Gammie's paper, which we commend to every one interested in botanical geography, and to the aspects of vegetation in one of the most interesting forest-regions of the world:

The Singalelah range is an elevated mountain pass, springing from the face of Kinchinjunga, and extending southward to the plains of India. Owing to the facilities of traveling afforded by the Nepal frontier road to Phalut, the range so far is much frequented by general travelers, and is, in consequence, too well explored to induce one to linger on the way in search of novelties. Some Yew-trees, Taxus baccata, grow close to the road beyond Tonglu, and Abies Webbiana is first seen on the last ridge between Tonglu and Sandakphu; from thence onward it exists in profusion up to 13,000 feet in elevation, covering mountain-sides with dense and sombre forests. There are trees of Tsuga Brunoniana below Phalut, and Juniperus Pseudo-Sabina abounds near the path to Cheabhanjan; but the other species of conifers, so characteristic of drier Sikkim, are altogether absent. Above 11,000 feet the most notable plants are Aconites and Meconopsis Wallichii, and a few species each of the genera Ranunculus, Anemone, Poten-

tilla, Primula, etc. Fragaria Daltoniana occurs here and there, bearing narrow oblong fruits, reminding one of small strawberries, and resembling them in flavor. The road from Sandakphu to Phalut passes through a forest of Abies Webbiana, associated with Pyrus foliolosa, Betula utilis, Acer caudatum and Prunus rufa, etc.; underneath them are thickets of various Rhododendrons and of two species of Bamboo.

On the slopes immediately below the summit of Phalut arboreal vegetation is scanty, and confined to sheltered ravines. The ground is everywhere covered with a sward of herbaceous plants. Anemone rivularis, with blue and white flowers, predominates. Primula rotundifolia and P. Sikkimensis (the latter affecting marshy situations in company with Calathoes palmata) are common. Meconopsis Wallichii is extremely abundant. The Bhutias eat the young stems of this plant, and the shoots of a Polygonatum are much esteemed by the Gurung shepherds. The young shoots of Bamboos are cooked and eaten. Rheum acuminatum is prevalent throughout the whole of alpine Sikkim, but is not utilized as food. Allium Wallichii, which is equally abundant, is consumed largely, sharing with the common onion the reputation of being an efficacious antidote against the physical discomforts experienced by men and animals at high elevations.

From Cheabhanjan onward to Kinchinjunga the only available path is that used by the shepherds, who pasture their flocks along the whole range during summer. For many miles this track follows the contour of the spur's crest, so that every day's march comprises many descents and ascents. As might be inferred from the proximity of the path to the ridge, streams supplying a sufficiency of water for our camp were few and far between, often necessitating long marches to obtain our two chief desiderata—a space large enough to contain our tents and water for cooking. At the end of the first day we found such a place at Ewanangi, a halting-stage for shepherds. Its elevation by B. P. thermometer was 11,174 feet. The camping-ground was covered with young plants of the formidable Cnicus eriophoroides, a large Thistle. At the commencement of this march we struck the Islumbo Pass, and continued in a northerly direction. The path runs through woods of Rhododendron arboreum, R. cinnabarinum, R. Falconeri, R. barbatum and R. Hodgsoni, Acer caudatum, Betula utilis, Pieris ovalifolia, Juniperus Pseudo-Sabina, Abies Webbiana, Prunus rufa, Arundinaria spathiflora, etc.

The following day's march was from Ewanangi to Megu. Two Gentians become common at about 12,000 feet—one, Gentiana stylophora, with large, terminal, greenish, Lily-like flowers; the other, Swertia Hookeri, conspicuous by its brown leaves and inflorescence, growing together in whorls on a stem often six feet high. A white and pink Primula is common; Rhododendron Anthopogon is abundant. Its fragrant leaves are largely collected and burned as incense in Buddhist temples. Small trees are represented by the species of Rhododendron formerly enumerated, Pyrus foliolosa, Prunus rufa and the bushy variety of Juniperus recurva, which forms excessively close thickets. Spiræa bella and Pyrus rhamnoides grow in open situations. Clematis montana, with large white flowers, climbs over bushes, and at once arrests attention. A succession of steep ascents and descents (where we first saw plants of Meconopsis simplicifolia in flower nestling under Berberry-bushes) was covered by a comparatively level path running over the rocks of glacial deposit, at the end of which lay the large and grassy flat of Megu, whose elevation by B. P. thermometer was 12,767 feet. Its bright green surface was interspersed with many plants of white Primroses and yellow Calathodes, a refreshing sight after traveling through such a long waste of Rhododendrons.

Attaining a ridge marked by a rudely built monument, bearing a small flag, we descended a steep gorge, down which a stream urged its turbulent course. The most noteworthy plant growing in the desolate locality we had traversed is the gigantic Rhubarb, Rheum nobile, always associated in the traveler's mind with barren precipices, where they delight to grow, and where they heighten the weird effect of such scenery by their cadaverous stave-like stems, for only by closer inspection can the actual beauty of the plant be realized. The only perfect specimens existed on inaccessible rocks, as the shepherds collect and devour all they find within reach.

Leaving Gambothan, which is 12,400 feet above sea-level, a steep ascent was made to the summit of the ridge—13,300 feet in elevation. For half the distance there is a scattered forest of Abies Webbiana, Juniperus recurva, Rhododendron campanulatum, Prunus rufa and Betula utilis; the upper part being almost wholly occupied by Rhododendron Anthopogon and R. setosum. These, when bruised or trodden upon, exhale a strong perfume from the superficial glands with which they are covered, aggravating the headaches to which all are subject at high elevations. Gentiana stylophora is exceedingly common. Beyond the ridge is the broad, open summit of Bokto, covered with grass, on which two large flocks of sheep were feeding. From this a descent has to be made into the valley of the Yangsap through dense growths of Rhododendrons, Abies Webbiana, Pyrus foliolosa and P. microphylla; beyond is a steep hill, almost devoid of vegetation and covered with boulders. The path winds up its right flank to a depression below its summit at about 14,000 feet elevation. There is a good wood of Juniperus Pseudo-Sabina, and the shrubby vegetation mainly consists of a Berberis not yet in leaf. Descending somewhat we crossed two small plains with a steep low ridge intervening. On these level tracts, intersected with sheep-walks, it would have been almost impossible to keep the proper paths had not the shepherds marked them with upright slabs of stones at regular distances. Leaving the second plain, a steep scramble along the inclined foot of an enormous black gneiss cliff brought us to the bank of Ratong River, on whose further side we camped on a flat grassy knoll, the only cleared spot in a waste of Rhododendrons.

In a second tour, Mr. Gammie visited the Lachung valley, where, at the head of the valley, 8,000 feet above the sea, he tells us:

This locality is eminently distinguished by its variety of coniferous trees. Abies Webbiana, the dominant species on the humid mountains of the Singalelah and Chola ranges, even here maintains its supremacy in numbers. It ranges from 9,000 to 13,000 feet. Up to 11,000 feet it grows intermingled with the other lighter-foliaged Pines, but from that elevation to its highest limit it exists alone or associates with the equally dark-colored Juniperus Pseudo-Sabina, so that nothing breaks the monotony of their sombre aspect on the slopes which they clothe with their lofty forest. Juniperus Pseudo-Sabina and J. recurva are the two last representatives of arboreal vegetation, both attaining 15,000 feet, the former as a small stunted, weather-worn tree, the latter as a prostrate intricately branched shrub.

Picea Morinda and Tsuga Brunoniana are found between 8,000 and 11,000 feet. The first is a tall, conical tree, with a thick trunk and dark green pendulous branches, the latter has spreading branches, drooping at the extremities, and bears very small cones. Larix Griffithii, the only Himalayan Larch, is restricted in its distribution to eastern Nepal, Sikkim and Bhutan, and previous to its rediscovery by Dr. Hooker its existence was only known from a notice in Griffith's journals. It is pyramidal in outline and attains a height of sixty feet. The branches are long and pendulous, supporting erect cylindrical cones, closely resembling those of Picea Morinda.

The Peach and Apricot, introduced from Thibet, are cultivated by the villagers at Lachung, but in no great quantity. I was informed that the fruits of both ripen in the end of September. Pyrus Sikkimensis, a wild Crab-apple tree, is common, but its austere fruit is only pleasantly edible when stewed with sugar. A little barley is reared, with radishes and turnips, which were the only vegetables I could obtain worth eating; their scanty yield of potatoes consisted of wretchedly small tubers, so waxy as to be nauseating when cooked.

Bulletin 35 of the West Virginia Agricultural Experiment Station is devoted to wood-boring insects and the defects in timber caused by them. Some of these insects infest dead trees only, others attack unhealthy standing trees, others still prefer the healthy wood of living trees. Some of them inhabit the sap-wood only, while others enter the heart-wood and make tunnels which may extend for several feet through the best part of the trunk. The so-called pin-holes in the heart-wood of Chestnut, for example, are made by an odd-looking worm which never infests a living tree unless some wound in the bark or wood is made where the parent beetle deposits her eggs. A broken branch or bruise in the bark will be sufficient to give them a start, and, according to Professor Hopkins, who writes this bulletin, a wound made by a small bullet in a thrifty young tree was sufficient to attract beetles, and although the wound was made some ten years ago it is still infested by the worms, which proves that the same wound may be utilized for years by successive generations. A wound to the bark of a young tree five or six inches in diameter from a load of shot has been known to start so many worms at work in the wood at that point as to kill the tree. Pin-holes in Oak, ranging from one one-hundredth to one-eighth of an inch in diameter are drilled by a similar worm, which also only attacks living trees where there has been some serious injury to the bark and sap-wood. Other pin-holes occur only in the sap-

wood. One variety known as the sap-wood timber-worm comes from eggs deposited in the crevices of the bark of the Yellow Poplar or Tulip-tree, Basswood, Buckeye, Chestnut and Black Walnut, and where logs are allowed to lie with bark on them has caused a loss of from five to ten per cent. of what would otherwise be good lumber—that is, every thousand feet of injured sap-wood means a loss of from fifteen to twenty dollars. Most of the insects which cause defects in the sap-wood of logs and dying trees attack only those with the bark on, and the proper method of prevention is to strip the bark from logs and felled trees which are cut between October 1st and April 1st, when they are to lie more than one month after the later date before they can be converted into lumber, and from all logs cut between April 1st and October 1st, unless they can be converted into lumber directly after the trees are felled. These dates are given because the eggs are laid during the months of April, May, June and July. Larger tunnels, known as worm-holes, are caused by the so-called carpenter-worms, the pine-sawyer and other grubs, and any worm-hole or pin-hole may become enlarged by decay or by the work of ants and other insects, so that the value of otherwise clear lumber is depreciated, causing great loss to producers and dealers. Besides this, premature decay results from the moisture and fungous germs which find lodgment in the wood of trees and in manufactured timber products through these entrances made by insects, and thus causes loss to both producers and consumers. The amount of this loss varies in different kinds of timber and in different localities from five per cent. to fifty per cent. of the total output, and sometimes is sufficient to reduce the receipts of an investment below the cost of production. Professor Hopkins gives an account of the precautions which should be used in managing standing and felled timber against these insects, the methods of preventing their attacks and the methods of destroying the insects themselves; and since insects which do this damage have not all been carefully studied and it is a difficult matter to become familiar with their life-histories, it becomes important that the appearance of any new pest of a threatening character should be reported as soon as possible to a competent entomologist, so that the proper remedy may be at once applied. This bulletin will be of great value to all persons who deal in wood products, and will interest every intelligent reader.

Notes.

Mr. Frank Lamson-Scribner, Director of the Tennessee Agricultural Experiment Station, has been commissioned by the Department of Agriculture to collect and impart useful information regarding our Grasses.

At this season, wherever any planting is done for beauty or for use, a little ground should be set apart for the children in every home. The possession and cultivation of a miniature garden will do much to cultivate habits of observation, turn the attention to the mysteries and beauties of plant-life and develop a taste which will be a fruitful source of pleasure in after life.

Mr. S. D. Willard considers unleached wood-ashes the best fertilizer for the Plum-orchard, but when that cannot be obtained he uses some potash salt, usually the muriate of potash, with a guaranteed analysis of sixty-seven per cent. Bone-meal is applied to furnish phosphoric acid. The abundant use of barn-yard manure produces a rank growth which is too easily winter-killed.

Where the kerosene emulsion is needed only in small quantities the methods recommended, which are usually for large supplies, are cumbersome. A correspondent of the *Farm Journal* gives the following plan: Put in a demijohn, jug or large bottle two ounces of any hard soap, shaved fine, then pour in a quart of hot water to dissolve it, and while hot add half a pint of kerosene. Shake the bottle violently until a milky fluid is formed, with no free oil visible. Before using this dilute it with twice its bulk of warm water.

Any one who desires to identify the birds found in the northern states east of the Rocky Mountains will find substantial aid in the little Pocket Key compiled and published by Professor A. C. Apgar, of Trenton, New Jersey. The few technical terms used in the book are defined in a brief vocabulary, but it is written throughout in the plainest language, and the most conspicuous external parts of the bird are used to help in the determination. The book follows the same admirable plan which Professor Apgar has used in his key of the trees and shrubs of this region.

To illustrate the possibilities of improvement by selection, Mr. Brill, of Hempstead, Long Island, in an address before a farmers' institute, stated that one of his neighbors began ten years ago to secure a strain of Asparagus by selecting white shoots with the purpose of establishing a fixed variety which would produce nothing but white asparagus. Fully ninety per cent. of his plants now come true, and for every bunch sold he receives a substantial advance over the market price, and every pound of seed which he saves is worth three times as much as ordinary Asparagus-seed.

Mr. R. T. Titus, of Westbury, Long Island, who exhibited thirty-four varieties of potatoes at the Wold's Fair, tested one hundred varieties last year, and found the most productive to be Rural New Yorker No. 2, which yields a tuber of fine shape with few small ones in the hill. Rural Blush, a very large late potato, but liable to rot, followed next in amount of yield; American Wonder is recorded as of the best quality and free from disease; Michigan Rose is called the favorite in the New York markets, and good in every particular, while King of the Roses is noted as early, a good cropper and strong grower and of excellent quality.

In a trial of twenty-five different varieties of Blackberries at the New York Experiment Station last year the old Dorchester, which was introduced forty years ago, yielded the greatest amount of fruit, of medium size, good color, sweet, juicy and of good flavor and quality. Ancient Briton was next in productiveness, followed in order by Early Harvest, Agawam and Kittatinny. Of the Black Caps, Mills No. 7 was the most productive variety, followed by Mills No. 15, which was the most productive of all the late-fruiting varieties. Carman is noted as a desirable early sort. Of the Red Raspberries, Pomona was the most satisfactory early variety, and it also gave good pickings later in the season. Royal Church and Cuthbert are pronounced the best for late picking.

The sudden and severe cold which followed the warm weather of early March has not probably done serious damage to the fruit in this latitude, but farther south it has been a serious disaster. In this city the effect was immediately felt in the increased price of such early vegetables as were coming from Savannah, Charleston and North Carolina. Professor Massey writes that in Raleigh everything had advanced to exuberant growth. Peaches and plums were well set, and Apples were in full bloom, while in the gardens the peas were set in the pods, and Beans, Melons, Tomatoes and Corn were growing in the open ground. On Easter Monday the roofs showed a hoar-frost as white as snow; the next day the mercury stood at twenty-two and a keen wind was blowing. Peas, Cabbage, Radishes, Lettuce, Potatoes and everything in the garden were blackened and killed. It seems hardly possible that any Peaches or Plums will escape, and Grapes will probably make no crop. Everything was in full sappy growth and everything has suffered, so that the loss throughout the south is enormous.

One of the most serious enemies with which the fruit-growers in California have had to contend against is the San Jose scale, Aspidiotus perniciosus. Last year it was first discovered in the eastern states near Charlottesville, Virginia, and the Board of Agriculture of that state and the United States Department of Agriculture have just completed a series of fumigating operations which it is hoped has destroyed it in that locality. It has recently been discovered, however, at De Funiak Springs, Florida, and in Charles County, Maryland, where an orchard of three hundred Peach-trees and Apple-trees is severely injured. It has probably been brought eastward upon nursery-stock imported from California, and if this is true, similar diseased stock has probably been brought to other parts of the east. It is important that fruit-growers should make an immediate examination of their orchards to ascertain whether or no this insect has made its appearance, for if it is allowed to spread the evil will be a serious one. The insect is a small, flat, round scale, rather lighter in color than the bark of a tree, and is most abundant on young limbs and twigs. At this season it is about one-eighth of an inch in diameter, and there is in the middle of each scale a small elevated, blackish, rounded point. The wood underneath it is apt to be discolored. Where the insects are abundant the bark is completely hidden, and the scales are then hardly distinguishable by the naked eye. Fruit-growers discovering this scale should at once notify the Department at Washington and send specimens. An emergency bulletin is being prepared which will give a full account of the insect, together with the best means to be used against it, and it will be sent to all applicants as soon as it is published.